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(54) **Apparatus for reducing the available volume of the human stomach**

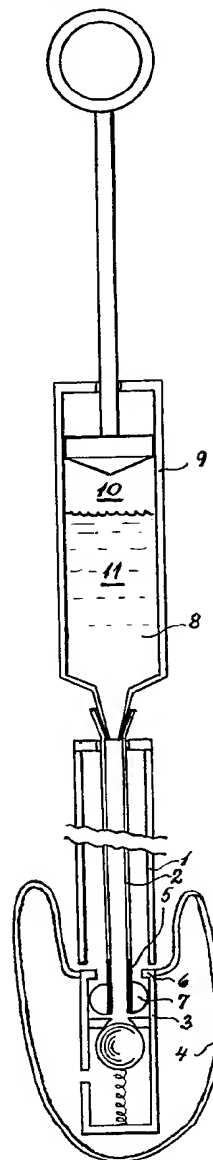
(57) An apparatus is provided for reducing the available volume of the human stomach whereby a loss of weight of an overweight patient can be obtained.

The said apparatus is adapted for introducing an expandable foreign member through the mouth and the gullet for freely detached positioning in

the human stomach. The apparatus is characterized by a combination of an elongated introducing member (1, 2, 5, 7) which can be positioned stretching through the mouth and the gullet having a first end projecting from the mouth and a second end projecting into the stomach, and an acid-resistant hollow foreign member (4) having a uniform thickness. The said introducing

(57) continued overleaf...

Fig. 1



member comprises an elastic introducing tube (2) which at its first end is provided with a means (9) for supplying pressurized gas, air and/or liquid for expanding the said member, and which at its second end is provided with a withdrawable packing member (7) being positioned in a one-way valve member (3) which constitutes an integral part of the foreign member (4). The said introducing tube (2) is encased within an outer elastic tube (1) which connects the lower end of the means for supplying air, gas and/or liquid with the upper end of the valve member, said outer tube acting as a holder-on on the edge (6) of the said valve member (3).

Fig. 1

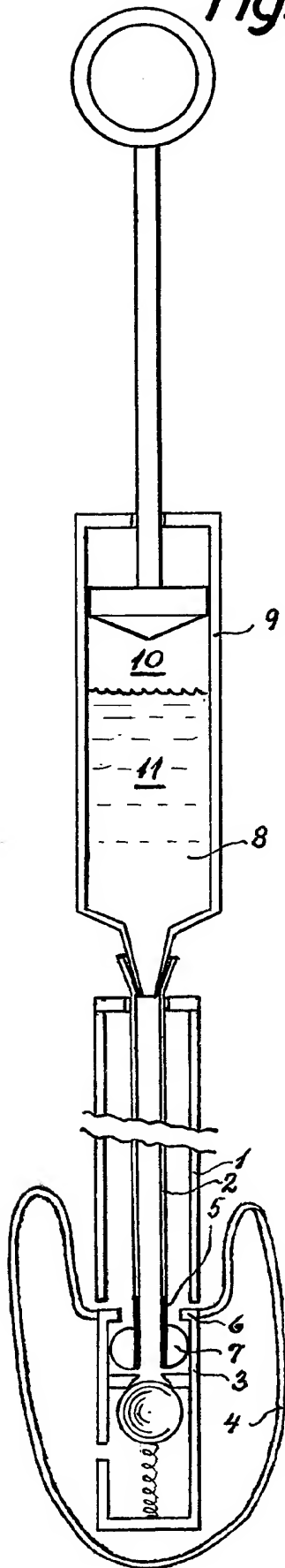


Fig. 2

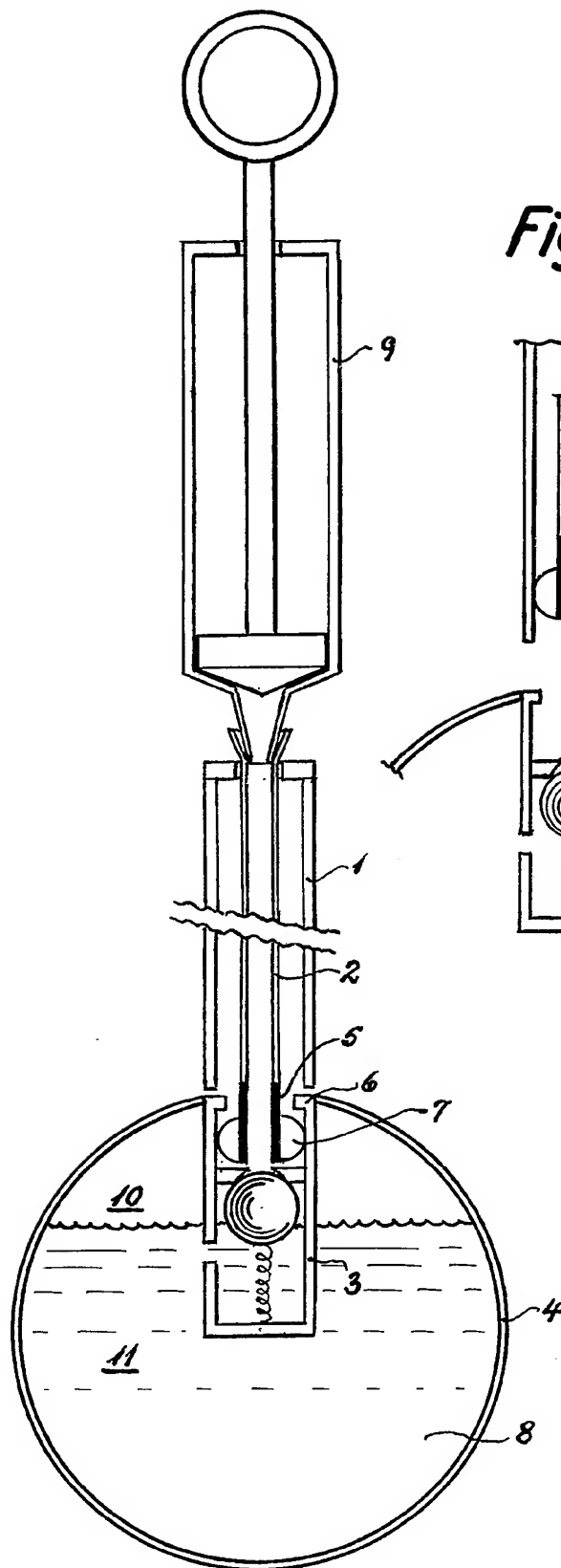
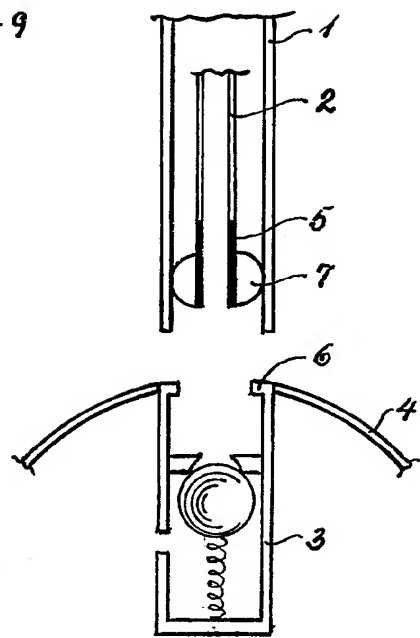
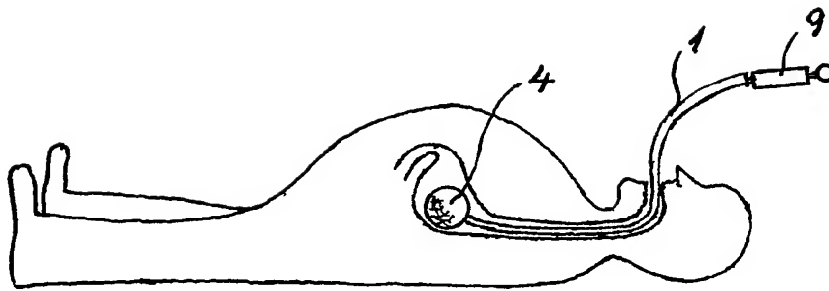
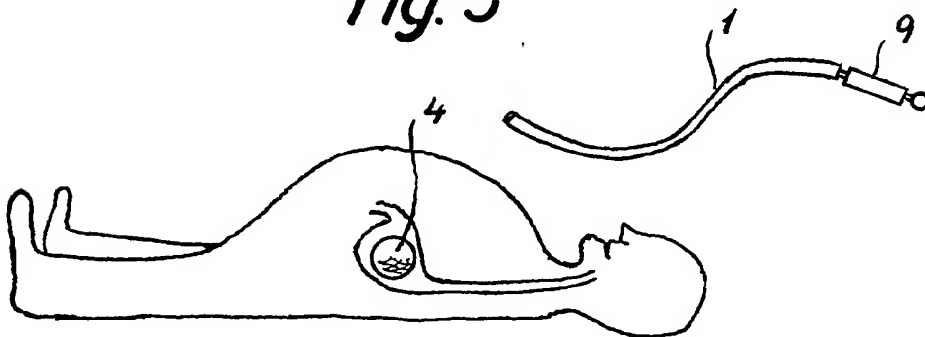


Fig. 3



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Fig. 4*Fig. 5*

SPECIFICATION

Apparatus for reducing the available volume of the human stomach

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This invention relates to an apparatus for reducing the available volume of the human stomach.

This apparatus is adapted for introducing into and leaving in the stomach a freely detached, expanded or inflated foreign member for an indefinite or predetermined period of time, the foreign member after being expanded or inflated having a size which makes it impossible to swallow.

When the available volume of the stomach is reduced by means of the apparatus of this invention, the person having the expanded or inflated member positioned in the stomach gets a feeling of a filled stomach when taking in smaller amounts of food (solid or liquid) than was necessary for obtaining the same feeling of a filled stomach without having the said member positioned in the stomach. Thus, the invention is useful when a reduced intake of food is desirable, in particular when a loss of weight of an overweight person or patient is aimed at.

It is known to introduce foreign members in the stomach. Furthermore, it is known to introduce foreign members in the stomach making use of an inflation of the said members with air to a size which it is impossible to swallow. However, it is common to this prior art that no foreign member is left freely detached in the stomach, since the said foreign members are invariably connected to a device outside the person or patient through a permanent connection.

The prior art includes methods by means of which foreign members having no permanent connection to outside the body of the patient are introduced into and left in the stomach. However, when using these methods the foreign members are invariably left in a condition involving a permanently fixed connection between the said members and the mucous membrane and/or the musculature of the stomach. Hence, these prior art foreign members are not freely positioned in the stomach.

It is an object of the invention to provide a method and apparatus for reducing the free or available volume of the human stomach.

More specifically, it is an object of the invention to provide a method and an apparatus for introducing into the stomach through the mouth and the gullet an expandable or inflatable foreign member which is thereafter left in a freely detached position in the stomach.

A further object of the invention is to provide a method for obtaining a loss of weight of an overweight person or patient by introducing into and leaving in the stomach a freely detached, inflated or expanded foreign member which occupies a desired portion of the stomach volume.

According to the present invention then there is provided an apparatus for introducing an expandable or inflatable foreign member through the mouth and the gullet for freely detached positioning in the human stomach, said apparatus comprising a combination of an elongated introducing member

which can be positioned stretching through the mouth and the gullet having a first end projecting from the mouth and a second end projecting into the stomach, and an acid-resistant hollow foreign member which can be filled or inflated to a gas-, air- and/or liquid-filled yielding member having a uniform wall thickness, the said introducing member comprising an elastic introducing tube which at its first end is provided with a means for supplying pressurized gas, air and/or liquid for expanding or inflating the said member, and which at its second end is provided with a withdrawable packing member being positioned in a one-way valve member which constitutes an integral part of the foreign member, the said introducing tube being encased within an outer elastic tube which connects the lower end of the means for supplying gas, air and/or liquid with the upper end of the valve member, said outer tube acting as an abutment on the edge of the said valve member.

The packing member is preferably a thickening of or a thickened portion of the elastic introducing tube itself.

Preferably the upper edge of the valve member is made of hard, non-yielding material and wraps loosely around the lower end of the elastic introducing tube.

The one-way valve member may be any suitable type of one-way valve, but in practice a spring loaded ball valve member is usually preferred.

It is preferred to incorporate an X-ray contrast agent in the wall of the expandable or inflatable foreign member.

In a specific embodiment the foreign member is expanded or inflated to an air- or gas-filled, yielding member having a uniform wall thickness.

The present invention will now be described further by way of example only, with reference to the accompanying drawings, in which:-

Figure 1 shows the apparatus of the invention in its packed form, i.e. as appearing prior to and during introducing of the foreign member in the stomach.

Figure 2 shows the apparatus with the foreign member in its expanded or inflated state.

Figure 3 shows details of the apparatus with expanded or inflated foreign member part and the introducing means separated therefrom.

Figure 4 shows the apparatus including the expanded or inflated foreign member introduced into the stomach of a person or patient.

Figure 5 shows the apparatus after introduction of the foreign member which is left in a freely detached and expanded or inflated position in the stomach of a person or patient.

Like reference numerals have been used to indicate like or corresponding parts in the drawings.

Referring to *Figure 1* there is illustrated apparatus for reducing the available volume of the human stomach. The apparatus has an elongated introducing member and a hollow foreign member 4. The introducing member comprises an outer tube 1 and an inner tube 2 disposed coaxially within the outer tube. The outer tube is made of an elastic material which may be any suitable elastic material. Likewise the inner tube is made of any suitable elastic

material. A lower part 5 of the inner tube 2 is made of hard non-yielding material of any suitable type, and is provided with a thickening or thickened portion or rib 7 which functions as an air, gas and/or liquid tight packing during expansion or inflation of the foreign member 4.

The packing portion 7 cooperates with a valve 3 which is an integral part of the hollow foreign member 4. The valve 3 is a one-way valve and is shown as a spring loaded ball valve. Any suitable one way valve may be employed. The hollow foreign member 4 is expandable or inflatable and has a uniform wall thickness and is made of soft, yielding and acid resistant material of any suitable type. Preferably the wall of the member 4 has incorporated therein an X-ray contrast agent so that introduction of the member 4 into the stomach and later checking of the foreign member can be accomplished by means of an X-ray irradiation. An upper edge 6 of the valve 3 is made of a hard, non-yielding material. The said edge 6 is positioned loosely around the lower part 5 of the inner introducing tube 2. By means of a pulling or drawing motion in an upward direction, as illustrated, or axial direction, the package portion 7 can be pulled out of the valve 3 and into the outer tube 1. The outer tube 1 functions as a holder-on or abutment on the edge 6 of the valve 3.

At the upper end of the introducing tube, that is to say the end remote from the hollow member 4 there is mounted an injection device 8 in the form of a hypodermic syringe or the like.

The device 8 contains sterile water or another sterile liquid 11 as well as sterile air or sterile inert gas 10. The liquid is preferably sterile water, and the sterile gaseous medium is preferably air. The volumes of 10 and 11 are balanced so as to be suitable for injection through the tube 2 into the member 4 when the latter has been introduced into the stomach. The parts 1, 2, 5, 7 and 8 taken together form the introducing portion of the apparatus, whereas the parts 3, 4 and 6 taken together form the foreign member portion of the apparatus.

As already mentioned, Figure 2 shows the apparatus with the foreign member in its expanded or inflated state, i.e. when introduced in the stomach and just prior to detachment of the foreign member portion. A plunger of the syringe has been displaced and the liquid 11 and gas 10 transferred to the hollow member 4.

Figure 3 illustrates the apparatus in its state following detachment of the introducing portion from the foreign member portion. The foreign member is hereby left freely detached in the stomach, and the introducing portion is pulled back from the stomach, through the gullet and out through the mouth.

In operation, the outer and inner tubes together with the attached foreign member are introduced through the patient's mouth and gullet and advanced until the foreign member portion reaches the stomach. The foreign member is then expanded or inflated by means of the injection device, thus filling the foreign member with air, gas and/or liquid. The foreign member is then ready for being left in the

stomach, and the introducing portion is detached from the foreign member portion by pulling back as described above.

70 CLAIMS

1. An apparatus for introducing an expandable or inflatable foreign member through the mouth and the gullet for freely detached positioning in the human stomach, said apparatus being characterized by a combination of an elongated introducing member, which can be positioned stretching through the mouth and the gullet having a first end projecting from the mouth and a second end projecting into the stomach, and an acid-resistant hollow foreign member which can be expanded or inflated to a gas-filled, air-filled and/or liquid-filled yielding member having a uniform wall thickness, the said introducing member comprising an elastic introducing tube which at its first end is provided with a means for supplying pressurized gas, air and/or liquid for expanding or inflating the said member, and which at its second end is provided with a withdrawable packing member being positioned in a one-way valve member which constitutes an integral part of the foreign member, the said introducing tube being encased within an outer elastic tube which connects the lower end of the means for supplying gas, air and/or liquid with the upper end of the valve member, the said outer tube acting as an abutment on the edge of the said valve member.

2. An apparatus as claimed in claim 1, in which the packing member is a thickening or a thickened portion of the elastic introducing tube.

3. An apparatus as claimed in claim 1 or 2, in which the upper edge of the valve member is made of hard, non-yielding material and wraps loosely around the lower end of the elastic introducing tube.

4. An apparatus as claimed in claim 1, 2 or 3, in which the one-way valve member is a spring loaded ball valve.

5. An apparatus as claimed in any of claims 1, 2, 3 or 4, in which an X-ray contrast agent is incorporated in the wall of the foreign member.

6. An apparatus as claimed in claims 1 to 5, in which the foreign member is expandable or inflatable to an air- or gas-filled, yielding member having a uniform wall thickness.

7. An apparatus constructed and arranged substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

8. An apparatus constructed and adapted to operate substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.